GEOTECHNICAL INVESTIGATION REPORT
PROPOSED ORCHARD DOWNSIZING AND NEW BUILDING PAD
WESTGATE WEST SHOPPING CENTER – PHASE II
LAWRENCE EXPRESSWAY AND PROPSECT ROAD
SAN JOSE, CALIFORNIA

KLEINFELDER PROJECT NO.: 20180325.002A

July 20, 2017

KLEINFELDER
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July 20, 2017
Project No. 20180325.002A

Ms. Cindy Johnson
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SUBJECT: Geotechnical Investigation Report
Proposed Orchard Downsizing and New Building Pad
Westgate West Shopping Center – Phase II
Lawrence Expressway and Prospect Road
San Jose, California

Dear Ms. Johnson:

Kleinfelder is pleased to present our geotechnical investigation report for the proposed Orchard Supply Hardware (Orchard) store downsizing and new building pad in San Jose, California. Our services were provided in general accordance with our proposal dated May 11, 2017.

This report covers the demolition of existing buildings on the subject new building pad, design and construction of a new wall/foundation for the adjacent existing Orchard hardware store building where a portion of the existing building will be demolished to make room for the new building pad, and regrading of the subject building pad to be delivered to future tenant. We understand the new building of the subject new building pad will be designed and constructed by future tenant, and the design and construction of such building is not covered under this report.

Based on the conditions encountered during the field exploration and our current understanding of the project, it is our opinion that the subject project is feasible from a geotechnical engineering standpoint provided that the recommendations presented in this report are incorporated into the design and construction of the subject project. The new building wall of the existing Orchard hardware store building may be supported on a shallow foundation system. Differential settlements between the existing and new foundations will be equivalent to the total settlement of the new foundations, and may be up to 1 inch; the structural design, utilities and architectural features should be designed to accommodate this potential differential settlement. Geotechnical recommendations are presented in this report.

We appreciate the opportunity to provide our services for this project. If you have questions regarding this report or need further assistance, please contact us at your convenience.

Sincerely,

KLEINFELDER, INC.

REGISTERED PROFESSIONAL ENGINEER
DONALD BENSON ADAMS
No. C 74990
Exp. 12/31/17
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1.0 INTRODUCTION

In this report we present the results of our geotechnical engineering investigation performed for the proposed Orchard hardware store downsizing and new building pad to be located in the Westgate West Shopping Center, at the intersection of Lawrence Expressway and Prospect Road in San Jose, California. A site vicinity map is shown on Figure 1.

This report covers the demolition of existing buildings on the subject new building pad, design and construction of a new wall/foundation for the adjacent existing Orchard hardware store building where a portion of the existing building will be demolished to make room for the new building pad, and regrading of the subject building pad to be delivered to a future tenant. Some minor repaving may be required. Other improvements may include exterior concrete flatwork, landscaping, and buried utilities. We understand the new structure of the subject new building pad will be designed and constructed by future tenant. At this time, we understand that the potential future tenant plans to construct a new fitness center on the subject building pad. The design and construction of such building is not covered under this report.

Based on a Leasing Plan prepared by Retail Design Collaborative, dated May 2, 2017, the proposed new building pad is currently occupied by commercial buildings, including an existing Orchard Supply Hardware (Orchard) store. We understand that the commercial buildings and a portion of the hardware store will be demolished, a new wall for the Orchard hardware store building will be constructed and the building pad will be prepared. The areas around the north, east, and south sides of the new building pad are currently paved parking areas. A loading dock with a depressed ramp is located on the north side of the proposed building pad.

The proposed building pad footprint will be rectangular in shape, and will have a ground floor area of about 30,000 square feet (220 feet by 138 feet). The remaining hardware store building will be abutting the building pad on the west side. The building site and the surrounding areas are relatively flat, so no significant cuts and fills are expected. We envision that the depressed loading dock ramp on the north side of the site will be removed, and the depressed area will be backfilled to the building pad grade.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of our services was to explore and evaluate the subsurface conditions at the site in order to develop recommendations related to the geotechnical aspects of project design and construction.

The scope of our services was outlined in our Proposal (MP180873.001P) dated May 11, 2017 and included the following:

- A site reconnaissance to observe the surface conditions at the project site
- A field investigation that consisted of drilling borings in the area of the proposed development to explore the subsurface conditions
- Laboratory testing of selected soil samples obtained during the field investigation to evaluate relevant physical and engineering parameters of the subsurface soils
- Evaluation of the field and laboratory data obtained and performing engineering analyses to develop our geotechnical conclusions and recommendations
- Preparation of this report which includes:
  - Site vicinity map and exploration location map
  - Description of the project
  - Boring logs and laboratory tests
  - Conclusions pertaining to feasibility of the proposed development, impacts of geotechnical and geologic features on the proposed development and geologic hazards
  - Recommendations for spread footings and slabs-on-grade including mitigation of expansive soils
  - Recommendations for site grading, subgrade preparation, earthwork, and fill placement and compaction specifications
  - Additional construction considerations, as applicable
  - Seismic design parameters in accordance with 2016 California Building Code (CBC)

3.0 FIELD AND LABORATORY INVESTIGATIONS

3.1 FIELD INVESTIGATION

3.1.1 Exploratory Borings

The subsurface conditions at the site were explored by drilling two exploratory borings, B-1 and B-2, on June 23, 2017. The two borings were drilled to depths of about 22.5 feet (Boring B-1) and about 25 feet (Boring B-2) below existing grade. The borings were drilled using a B24 Mobile truck-mounted drill rig utilizing a 4-inch outside-diameter solid-stem augers. The approximate boring locations are presented on Figure 2. Explorations were located in the field by measuring from existing landmarks. Horizontal coordinates and elevations of the borings were not surveyed.

A Kleinfelder professional maintained logs of the borings, visually classified the soils encountered according to the Unified Soil Classification System presented on Figure A-1 in Appendix A, and obtained relatively undisturbed and bulk samples of the subsurface materials. Soil classifications made in the field from samples and auger cuttings were in accordance with American Society for Testing and Materials (ASTM) Method D 2488. These classifications were re-evaluated in the laboratory after further examination and testing in accordance with ASTM D 2487. The undrained shear strengths of cohesive soil samples were estimated in the field using a hand-held penetrometer device. Sample classifications, blow counts recorded during sampling, and other related information were recorded on the boring logs. The blow counts listed on the boring logs have not been corrected for the effects of overburden pressure, rod length, sampler size, or hammer efficiency. Correction factors were applied to the raw blow counts to estimate the sample apparent density noted on the boring logs and for engineering analyses. After the borings were completed, they were backfilled with cement grout and patched with asphalt at the surface.

Soil cuttings were placed in 55-gallon drums during drilling. At the completion of our field exploration, a sample of the soil cuttings was collected for analytical testing. The analytical test results indicate that the sample tested was considered non-hazardous, and the soil cuttings were disposed of at a state-licensed facility by our subcontractor.

Keys to the soil descriptions and symbols used on the boring logs are presented on Figures A-1 and A-2 in Appendix A. Logs of the borings are presented on Figures A-3 through A-4.

3.1.2 Sampling Procedures

Soil samples were collected from the borings at depth intervals of approximately 2½ to 5 feet. Samples were collected from the borings at selected depths by driving either a 2.5-inch inside diameter (I.D.) California sampler or a 1.4-inch I.D. Standard Penetration Test (SPT) sampler driven 18 inches (unless otherwise noted) into undisturbed soil. The samplers were driven using a 140-pound manual (cathead and rope) hammer free-falling a distance of about 30 inches. Blow counts were recorded at 6-inch intervals for each sample attempt and are reported on the logs.

The SPT sampler did not contain liners, but had space for them. The 2.5-inch I.D. California sampler contained stainless steel liners. The California sampler was in general conformance with ASTM D3550. The SPT sampler was in general conformance with ASTM D1586.

Soil samples obtained from the borings were packaged and sealed in the field to reduce moisture loss and disturbance. Following drilling, the samples were returned to our laboratory for further examination and testing.

3.2 GEOTECHNICAL LABORATORY TESTING

Kleinfelder performed laboratory tests on selected samples recovered from the borings to evaluate their physical and engineering characteristics. The following laboratory tests were performed:

- Unit Weight (ASTM D2937)
- Moisture Content (ASTM D2216)
- Atterberg Limits (ASTM D4318)
- Particles Finer Than #200 Sieve (ASTM D1140)
- Sieve Analysis, Coarse and Fine (ASTM D6913)
- Unconsolidated Undrained Triaxial Shear (ASTM D2850)
- Corrosion - Soluble Sulfate Content (ASTM D4327)
- Corrosion - Soluble Chloride Content (ASTM D4327)
- pH (ASTM D4972)
- Minimum Resistivity (ASTM G57)

The results of geotechnical laboratory tests are included on the boring logs in Appendix A and are summarized in Appendix B. The soluble sulfate, soluble chloride, pH, and minimum resistivity test results are discussed in Section 5.11 of this report. The laboratory reports are included in Appendix B and Appendix C.

4.0 SITE CONDITIONS

4.1 SITE DESCRIPTION

The site is currently occupied by commercial buildings, including an existing Orchard hardware store. The areas around the north, east and south sides of the site is mostly paved for parking, and a loading dock with a depressed ramp is located on the north side of the site. The site is relatively flat.

4.2 SUBSURFACE CONDITIONS

The following description provides a general summary of the subsurface conditions encountered during the current study performed at the site. For more thorough descriptions of the actual conditions encountered at specific exploration locations, refer to the subsurface exploration logs located in Appendix A.

The two borings were drilled in asphalt paved areas. The asphalt pavement section thicknesses varied between about 4.5 inches in Boring B-1 to about 5 inches in Boring B-2. The asphalt sections were underlain by an aggregate base section; thicknesses of the aggregate base were not measured, however based on our previous experience at the site it is assumed the base thickness is approximately 6 inches.

Underneath the pavement section, in Boring B-1, very stiff to hard, low to medium plasticity lean clays, sandy lean clays and gravelly lean clays were encountered to a depth of about 13 feet. A medium dense sand lens with gravel was encountered beneath the clay to a depth of approximately 15½ feet, which was underlain by very stiff to hard, low plasticity lean clays and gravelly lean clays to the termination of the boring. The boring was terminated at a depth of about 22½ feet due to auger refusal.

Underneath the pavement section, in Boring B-2, very stiff to hard, low to medium plasticity lean clays, sandy lean clays and gravelly lean clays were encountered to the termination of the boring. The boring was terminated at a depth of about 25 feet due to auger refusal.

No groundwater was encountered in the borings during our investigation. Based on the California Geological Survey (CGS, 2002), groundwater at the site is anticipated to be greater than 50 feet below ground surface.

Our interpretations of soil and groundwater conditions at the site are based on the conditions encountered in the borings, published geologic maps, and our knowledge of geologic and hydrogeologic conditions in the site vicinity. It is possible that groundwater conditions at the site could change due to variations in rainfall, groundwater withdrawal or recharge, construction activities, well pumping, or other factors not apparent at the time of our investigation. If soil or groundwater conditions exposed during construction vary from those presented in this report, Kleinfelder should be notified to evaluate whether our conclusions or recommendations should be modified.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL

Based on our findings, it is our professional opinion that the subject project is feasible from a geotechnical engineering standpoint provided that the recommendations presented in this report are incorporated into the design and construction. Specific conclusions and recommendations regarding the geotechnical aspects of design and construction are presented in the following sections.

5.2 GEOLOGIC HAZARDS

The site is not located within a State-designated Alquist-Priolo Earthquake Fault Zone where site-specific studies addressing the potential for surface fault rupture are required, and no known active faults traverse the site. In our opinion, the potential for fault-related ground surface rupture at the site is low.

Earthquake-induced soil liquefaction can be described as a significant loss of soil strength and stiffness caused by an increase in pore water pressure resulting from cyclic loading during shaking. The site is not located within a State of California Seismic Hazard Zone for liquefaction where areas of historical occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required (CGS, 2003b). As indicated in Section 4.2 of this report, groundwater at the site is anticipated to be greater than 50 feet below ground surface. Based on these reasons, in our opinion, the potential for earthquake-induced soil liquefaction at the site is low.

Lateral spreading is a potential hazard commonly associated with liquefaction where extensional ground cracking and settlement occur as a response to lateral migration of subsurface liquefiable material. These phenomena typically occur adjacent to free faces such as slopes and creek channels. Since no slopes and channels are located in the vicinity of the site, and the potential of liquefaction is considered low, in our opinion, the potential for lateral spreading at the site is low.

Dynamic compaction, or seismic settlement, typically occur in unsaturated, loose granular material or uncompacted fill soils. Since the site soils generally consist clayey soils interbedded with relatively thin layers of medium dense sand and clayey sand, in our opinion, the potential for dynamic compaction at the site is low.

5.3 EXPANSIVE SOILS

Based on the results of Atterberg Limits tests performed on near-surface soil samples, the surficial soils have low expansion potential. These surficial soils may shrink or swell as a result of soil moisture content changes, but the amounts of shrinking and swelling are expected to be relatively small. It is our opinion that moisture conditioning of the clayey soils and maintaining the moisture during site grading and keying the exterior continuous wall footing into clayey soils could reduce the risk of building distresses due to expansive soils.

5.4 CBC SEISMIC DESIGN CRITERIA

Considering the location of the site and the soils that were encountered during the field exploration, the site can be classified as Site Class D according to Table 20.3-1 of the ASCE7-10. Site Class D is defined as a soil profile consisting of stiff soil with a shear wave velocity between 600 feet/second and 1,200 feet/second, standard penetration test (SPT) blow counts (N-value) between 15 blows per foot (bpf) and 50 bpf, or undrained shear strength between 1,000 pounds per square foot (psf) and 2,000 psf in the top 100 feet.

The site is located approximately at the following coordinates:

- Latitude: 37.294152 degrees
- Longitude: -121.996224 degrees

For a 2016 California Building Code (CBC) based design, the estimated Maximum Considered Earthquake (MCE) mapped spectral accelerations for 0.2 second and 1 second periods (S_S and S_1), associated soil amplification factors (F_a and F_v), and mapped peak ground acceleration (PGA) are presented in Table 5-1. Corresponding site modified (S_{MS} and S_{M1}) and design (S_{DS} and S_{D1}) spectral accelerations, PGA modification coefficient (F_{PGA}), PGA_M, risk coefficients (C_{RS} and C_{R1}), and long-period transition period (T_L) are also presented in Table 5-1. Presented values were estimated using Section 1613.3 of the 2016 California Building Code (CBC), chapters 11 and 22 of ASCE 7-10, and the United States Geological Survey (USGS) U.S. seismic design maps[1].

Table 5-1
Ground Motion Parameters Based on 2016 CBC

Parameter	Value	Reference
S_S	1.943	2016 CBC Section 1613.3.1
S_1	0.689g	2016 CBC Section 1613.3.1
F_a	1.000	2016 CBC Table 1613.3.3(1)
F_v	1.500	2016 CBC Table 1613.3.3(2)
PGA	0.748g	ASCE 7-10 Figure 22-7
S_{MS}	1.943g	2016 CBC Section 1613.3.3
S_{M1}	1.034g	2016 CBC Section 1613.3.3
S_{DS}	1.295g	2016 CBC Section 1613.4.4
S_{D1}	0.689g	2016 CBC Section 1613.4.4
F_{PGA}	1.000	ASCE 7-10 Table 11.8-1
PGA_M	0.748g	ASCE 7-10 Section 11.8.3
C_{RS}	1.026	ASCE 7-10 Figure 22-17
C_{R1}	0.969	ASCE 7-10 Figure 22-18
T_L	12 seconds	ASCE 7-10 Figure 22-12

5.5 SHALLOW FOUNDATIONS

5.5.1 Allowable Bearing Pressure

As indicated above, this report covers only the new wall/foundation of the adjacent existing Orchard hardware store building where a portion of the existing building will be demolished to make room for the new building pad. The adjacent new structure will be designed and constructed by future tenant, and such building is not covered by this report. Geotechnical design parameters such as allowable bearing pressure, minimum footing width, and minimum footing embedment depth of the new structure may be different from those presented in this report due to different building height and structural loads, and should be determined by the geotechnical engineer for that project.

[1] http://geohazards.usgs.gov/designmaps/us/

The new building wall of the existing Orchard hardware store building may be supported on continuous wall footings founded on firm and stable site soils. A net allowable bearing pressure of 2,500 pounds per square foot for dead plus sustained live loading may be used to size the continuous footings. A one-third increase in the allowable bearing pressure may be applied when considering short-term loading due to wind or seismic forces.

Continuous footings should have a minimum width of 18 inches for continuous footings. New strip footing embedment depth should match the foundation embedment depth of the existing Orchard store building, but should not be less than 12 inches.

Lateral loads may be resisted by a combination of friction between the foundation bottoms and the supporting subgrade, and by passive resistance acting against the vertical faces of the foundations. An allowable coefficient of sliding friction of 0.3 between the foundation and the supporting subgrade may be used for design. This value includes a safety factor of at least 1.5. For allowable passive resistance, an equivalent fluid weight of 300 pounds per cubic foot (pcf) acting against the side of the foundation may be used. This value is based on a safety factor of at least 1.5 and generally corresponds to a lateral deflection of less than ½ inch. Passive resistance in the upper 12 inches of soil should be neglected unless the area in front of the footing is protected from disturbance by concrete or pavement. The allowable friction coefficient and passive resistance may be used concurrently without reduction.

Total settlement of an individual foundation will vary depending on the plan dimensions of the foundation and the actual load supported. Based on the anticipated/assumed foundation dimensions and loads, we estimate the maximum total and differential foundation settlement of new spread foundations should be on the order of 1 and ½ inch, respectively, provided the recommendations presented in this report are followed. Differential settlements between the existing and new foundations will be equivalent to the total settlement of the new foundations, and may be up to 1 inch; the structural design, utilities and architectural features should be designed to accommodate this potential differential settlement.

5.5.2 Construction

Prior to placing steel or concrete, footing excavations should be cleaned of all debris, loose or soft soil, and water. All footing excavations should be observed by the project Geotechnical Engineer just prior to placing steel or concrete to verify the recommendations contained herein are implemented during construction. The structural engineer should evaluate footing configurations and reinforcement requirements to account for loading and settlement.

5.6 BUILDING SLABS-ON-GRADE

Since this report does not cover the new structure, no new building slabs-on-grade is expected under the current project. We can provide geotechnical recommendations for the design and construction of slabs-on-grade under a separate contract, if requested.

5.7 GENERAL EARTHWORK

We envision that earthwork of the subject project will be limited to the following:

- Removing existing foundations (assuming to be shallow foundations), existing underground utilities and associated bedding materials, and the existing depressed loading dock ramp; and backfilling the voids with engineered fill;
- Scarifying and recompacting the building pad subgrade; and
- Excavating for new wall foundation of the existing Orchard store building.

The following presents recommendations for general earthwork criteria.

5.7.1 Site Preparation

Site preparation will include demolishing the existing buildings. Information for the foundations of the existing buildings was not available, but are assumed to be shallow spread footings. We envision that building demolition will include removing the foundations and associated underground utilities and associated pipe bedding materials. Outside of the existing buildings, site preparation may include removing existing sidewalks, existing asphalt pavement and associated aggregate base materials. Existing utilities and associated bedding materials within the footprint of the new building should either be removed or plugged with cement grouted to prevent migration of soil and/or water. If the cement grouting method is used, the bedding material surrounding the utility lines should also be plugged at both ends by replacing the granular materials with compacted clayey soil or grout.

5.7.2 Subgrade Preparation

Prior to grading of the building pad, trenches and voids created from foundation and underground utilities removal should be backfilled by engineered fill. All loose and soft soils in the trenches and voids should be removed prior to backfilling.

All subgrade areas that will receive engineered fill for support of structures should be scarified to a depth of 12 inches, uniformly moisture conditioned to a moisture content at least 2 percent above the optimum moisture content, and compacted as engineered fill to at least 90 percent relative compaction (ASTM D 1557). Any disturbed soil, soft soil, or unstable soil should be removed and the void backfilled with engineered fill.

Also, in order to provide uniform support for the future new building, we recommend that the uppermost 12 inches of building pad, and extending at least 5 beyond the edge of the building, soil subgrade be scarified, moisture-conditioned to at least 2 percent above the optimum content, and recompacted to at least 90 percent relative compaction (ASTM D1557).

5.7.3 Temporary Excavations

Construction site safety is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. The contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Flatter slopes and/or trench shields may be required if loose, cohesionless soils and/or water are encountered along the slope face. Heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within a lateral distance equal to one-third the slope height from the top of any excavation. During wet weather, earthen berms or other methods should be used to prevent runoff water from entering all excavations. All runoff water**,** seepage, and/or groundwater encountered within excavations should be collected and disposed of outside the construction limits.

5.7.4 Fill Materials

The existing site soils encountered in our borings, minus debris, rock particles larger than 3 inches in maximum dimension, and deleterious materials, should be suitable for use as engineered fill. All import fill soils should be nearly free of organic or other deleterious debris, essentially non-plastic, and contain rock particles less than 3 inches in maximum dimension. In general, well-graded mixtures of gravel, sand, non-plastic silt, and small quantities of cobbles, rock fragments, and/or clay are acceptable for use as import fill. All imported fill materials to be used for engineered fill should be sampled and tested by the project Geotechnical Engineer prior to being transported to the site. Import fill guidelines are provided below.

Table 5-2
Import Fill Guidelines

Fill Requirement		Test Procedures	
		ASTM[1]	Caltrans[2]
Gradation			
Sieve Size	**Percent Passing**		
3 inch	100	D422	202
¾ inch	70-100	D422	202
No. 200	20-50	D422	202
Plasticity			
Liquid Limit	**Plasticity Index**		
<30	<12	D4318	204
Organic Content			
No visible organics		---	---
Expansion Potential			---
20 or less		D4829	---
Soluble Sulfates			
Less than 2,000 ppm		---	417
Soluble Chloride			
Less than 300 ppm		---	422
Resistivity			
Greater than 2,000 ohm-cm		---	643

[1]American Society for Testing and Materials Standards (latest edition)
[2]State of California, Department of Transportation, Standard Test Methods (latest edition)

Trench backfill and bedding placed within existing or future city right-of-ways should meet or exceed the requirements outlined in the current city specifications. Trench backfill or bedding placed outside existing or future right-of-ways could consist of native or imported soil that meets the requirements for fill material provided above. However, coarse-grained sand and/or gravel should be avoided for pipe bedding or trench zone backfill unless the material is fully enclosed in a geotextile filter fabric such as Mirafi 140N or an equivalent substitute. In a very moist or saturated condition, fine-grained soil can migrate into the coarse sand or gravel voids and cause “loss of ground” or differential settlement along and/or adjacent to the trenches, thereby leading to pipe joint displacement and pavement distress.

Trench backfill recommendations provided above should be considered minimum requirements only. More-stringent material specifications may be required to fulfill bedding requirements for specific types of pipe. The project Civil Engineer should develop these material specifications based on planned pipe types, bedding conditions, and other factors beyond the scope of this study.

5.7.5 Engineered Fill

All fill soils, either existing on-site or imported, required to bring the site to final grade should be compacted as engineered fill. The fill should be uniformly moisture conditioned to a moisture content at least 2 percent above the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 90 percent of the maximum dry density as determined by ASTM Test Method D 1557. Additional fill lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable. Discing and/or blending may be required to uniformly moisture condition soils used for engineered fill.

All trench backfill in building or other structural areas should be placed and compacted in accordance with the recommendations provided above for engineered fill. During backfill, mechanical compaction of engineered fill is recommended.

5.7.6 Wet/Unstable Subgrade Mitigation

If construction is to proceed during the winter and spring months, the moisture content of the near-surface soils may be significantly above optimum. This condition, if encountered, could seriously delay grading by causing an unstable subgrade condition. Typical remedial measures include discing and aerating the soils, mixing the soils with dryer materials, removing and replacing the soils with an approved fill material, stabilization with a geotextile fabric or grid, or mixing the soils with an approved hydrating agent such as a lime or cement product. Our firm should be consulted prior to implementing any remedial measure to observe the unstable subgrade condition and provide site-specific recommendations.

5.8 EXTERIOR FLATWORK

Subgrade soils underlying exterior flatwork should be scarified to a depth of about 12 inches, moisture conditioned, and recompacted. The subgrade preparation should extend beyond the proposed improvements a horizontal distance of at least 2 feet. The moisture content of the subgrade soils should be maintained at least 2 percent above optimum prior to the placement of any flatwork or engineered fill.

Where exterior flatwork is anticipated to be subjected to vehicular traffic, we recommend 4 inches of aggregate base, compacted to a minimum of 95 percent of the maximum dry density, be provided under the flatwork.

Moisture conditioning to the full 12-inch depth should be verified by the geotechnical engineer's representative. Careful control of the water/cement ratio should be performed to avoid shrinkage cracking due to excess water or poor concrete finishing or curing. Unreinforced slabs should not be built in areas where further saturation may occur following construction.

Exterior concrete slabs for pedestrian traffic should be at least 4 inches thick. Weakened plane joints should be located at intervals of about 6 feet. For large areas of hardscape, expansion joints should be placed at a minimum of 12- to 15-foot intervals.

5.9 SITE DRAINAGE

Foundation and slab performance depends greatly on proper irrigation and how well runoff water drains from the site. This drainage should be maintained both during construction and over the entire life of the project. The ground surface around structures should be graded such that water drains rapidly away from structures without ponding. The surface gradient needed to do this depends on the landscaping type. In general, landscape area within 10 feet of buildings should slope away at gradients of at least 5 percent, per Section 1804.3 of 2013 CBC.

We recommend that landscape planters either not be located adjacent to buildings and pavement areas or be properly drained to area drains. Drought resistant plants and minimum watering are recommended for planters immediately adjacent to structures. No raised planters should be installed immediately adjacent to structures unless they are damp-proofed and have a drainpipe connected to an area drain outlet. Planters should be built such that water exiting from them will not seep into the foundation areas or beneath slabs and pavement. Where slabs or pavement areas abut landscaped areas, the aggregate base and subgrade soil should be protected against saturation.

Vertical cut-off structures are recommended to reduce lateral seepage under slabs from adjacent landscaped areas, including bio-retention areas. Vertical cut-off structures may consist of deepened concrete perimeters, or equivalent, extending at least four (4) inches below the base/subgrade interface, or 1 foot below the base of the gravel retention layer underlying bio-swales, whichever is deeper. Vertical cut-off structures should be poured neat against undisturbed native soil or compacted clayey fill. The cut-off structures should be continuous.

In addition, waterproofing the slab and walls should be considered. Roof water should be directed to fall on hardscape areas sloping to an area drain, or roof gutters and downspouts should be installed and routed to area drains. In any event, maintenance personnel should be instructed to limit irrigation to the minimum actually necessary to properly sustain landscaping plants. Should excessive irrigation, waterline breaks or unusually high rainfall occur, saturated zones and “perched” groundwater may develop. Consequently, the site should be graded so that water drains away readily without saturating the foundation or landscaped areas. Potential sources of water such as water pipes, drains, and the like should be frequently examined for signs of leakage or damage. Any such leakage or damage should be promptly repaired. Wet utilities should also be designed to be watertight.

5.10 STORM WATER MANAGEMENT

We have evaluated the potential for storm water infiltration/percolation into the subgrade soils at the subject project site. As encountered during our field explorations at the project site, the upper soils are primarily fine grained (clay) and, consequently, have a very low hydraulic conductivity. Due to the clayey nature of the near-surface site soils, they are not considered conducive to infiltration systems for storm water management. Recommendations for implementation of storm water managements systems, if required, are presented below.

Recent storm water runoff regulations require pretreatment of runoff and infiltration of storm water to the extent feasible. Typically, this results in the use of bioretention areas, vegetated swales, infiltration trenches, buried storm water detention/infiltration galleries, or permeable pavement near or within parking lots and at the location of roof run-off collection. These features are not well-suited to fine-grained, low permeability soils, which do not allow significant infiltration over short time periods. In addition, allowing water to pond on potentially expansive clay soils can cause the soils to swell, which can cause distress to pavements, slabs, and lightly loaded structures.

Implementation of storm water infiltration criteria will likely result in increased distress and reduced service life of pavement and flatwork if not carefully designed in fine-grained soils. In general, bioretention areas, vegetated swales and infiltration areas should be located in landscaped areas and well away from pavements, buildings, and slopes.

If it is not possible to locate these infiltration systems away from buildings and/or pavements, alternatives that isolate the infiltrated water, such as flow-through planters, could be considered. When using an infiltration system in fine-grained soils, underdrains that discharge to the storm drains should be used. In addition, the top of the swales should be a laterally separated a minimum of 12 inches from the curbs. To reduce potential for rotation of the curbs, curbs adjacent to the swales should extend a minimum of 12 inches below the bottom of the aggregate base course.

5.11 SOIL CORROSIVITY

Kleinfelder has completed laboratory testing to provide data regarding corrosivity of onsite soils. Our scope of services does not include corrosion engineering and, therefore, a detailed analysis of the corrosion test results is not included in this report. A qualified corrosion engineer should be retained to review the test results and design protective systems that may be required. Kleinfelder may be able to provide those services.

Laboratory chloride concentration, sulfate concentration, pH, oxidation reduction potential, and electrical resistivity tests were performed on a near-surface soil sample. The results of the tests are presented in Appendix C and are summarized in Table 5-3. If fill materials will be imported to the project site, similar corrosion potential laboratory testing should be completed on the imported material.

Table 5-3
Chemistry Laboratory Test Results

Boring and Depth	Material	Resistivity, ohm-cm		pH	Oxidation Reduction Potential, mV	Water-Soluble Ion Concentration, ppm		
		Saturated	In-Situ Moisture			Chloride	Sulfide	Sulfate
B-1 Bulk A @ 1 – 2.5 ft.	Sandy Lean Clay with Gravel	1,700	7,500	8.00	+470	N.D.*	N.D.	55

*N.D. - None Detected

Ferrous metal and concrete elements in contact with soil, whether part of a foundation or part of the supported structure, are subject to degradation due to corrosion or chemical attack. Therefore, buried ferrous metal and concrete elements should be designed to resist corrosion and degradation based on accepted practices.

Based on the "10-point" method developed by the American Water Works Association (AWWA) in standard AWWA C105/A21.5, the soils at the site have a moderate corrosion potential to buried ferrous metal piping, cast iron pipes, or other objects made of these materials. We recommend that a corrosion engineer be consulted to recommend appropriate protective measures.

The degradation of concrete or cement grout can be caused by chemical agents in the soil or groundwater that react with concrete to either dissolve the cement paste or precipitate larger compounds within the concrete, causing cracking and flaking. The concentration of water-soluble sulfates in the soils is a good indicator of the potential for chemical attack of concrete or cement grout. The American Concrete Institute (ACI) in their publication "Guide to Durable Concrete" (ACI 201.2R-08) provides guidelines for this assessment. The sulfate tests indicated no detected sulfate in the sample. The results of sulfate test indicate the potential for deterioration of concrete is mild, no special requirements should be necessary for the concrete mix.

Concrete and the reinforcing steel within it are at risk of corrosion when exposed to water-soluble chloride in the soil or groundwater. Chloride tests indicated no detected chloride in the sample. The project structural engineer should review this data to determine if remedial measures are necessary for the concrete reinforcing steel.

6.0 ADDITIONAL SERVICES

The review of final plans and specifications, and field observations and testing during construction by Kleinfelder is an integral part of the conclusions and recommendations made in this report. If Kleinfelder is not retained for these services, the client agrees to assume Kleinfelder's responsibility for any potential claims that may arise during construction. The actual tests and observations by Kleinfelder during construction will vary depending on type of project and soil conditions. The tests and observations would be additional services provided by our firm. The costs for these services are not included in our current fee arrangements.

As a minimum, our construction services should include observation and testing during site preparation, grading, and placement of engineered fill and observation of foundation excavations prior to placement of reinforcing steel. Many of our clients find it helpful to have concrete compressive tests performed for each building even though this information may not be required by any agency. It may also be helpful to perform a floor level and crack survey of all slab-on-grade floors prior to the application of any floor covering. The floor level survey can be readily performed by the client or as an additional service provided by Kleinfelder using a manometer device.

7.0 LIMITATIONS

The conclusions and recommendations of this report are provided for the design and construction of the subject project located in Phase II of the Westgate West Shopping Center in San Jose, California, as described in the text of this report. The conclusions and recommendations in this report are invalid if:

- The assumed structural or grading details change
- The report is used for adjacent or other property
- Any other change is implemented which materially alters the project from that proposed at the time this report was prepared

The scope of services was limited to the drilling of two test borings in areas accessible to our drill rig. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions of this assessment are based on our subsurface exploration including borings drilled to a maximum depth of 25 feet; groundwater level measurements in test borings after drilling completion; laboratory testing of natural moisture content, in-place density, plasticity, and shear strength tests; and engineering analyses.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more-detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involve greater expense, our clients participate in determining levels of service which provide information for their purposes at acceptable levels of risk. The client and key members of the design team should discuss the issues covered in this report with Kleinfelder so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory tests, and our present knowledge of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may reevaluate the recommendations of this report. If the scope of the proposed construction, including the estimated building loads and the design depths or locations of the foundations, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed and the conclusions of this report are modified or approved in writing by Kleinfelder.

As the geotechnical engineering firm that performed the geotechnical evaluation for this project, Kleinfelder should be retained to evaluate whether the recommendations of this report are properly incorporated in the design of this project and properly implemented during construction. This may avoid misinterpretation of the information by other parties and will allow us to review and modify our recommendations if variations in the soil conditions are encountered. As a minimum, Kleinfelder should be retained to provide the following continuing services for the project:

- Review the project plans and specifications, including any revisions or modifications
- Observe the site earthwork operations to assess whether the subgrade soils are suitable for construction of foundations, slabs-on-grade, pavements and placement of engineered fill
- Evaluate whether engineered fill for the structure and other improvements is placed and compacted per the project specifications
- Observe foundation bearing soils to evaluate whether conditions are as anticipated

The scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

Kleinfelder cannot be responsible for interpretation by others of this report or the conditions encountered in the field. Kleinfelder must be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by a representative from Kleinfelder, including site preparation, preparation of foundations, installation of piles, and placement of engineered fill and trench backfill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinions, recommendations, or conclusions contained in the report. Because of the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder's geotechnical engineer can be contacted to evaluate those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction. Furthermore, the contractor should be prepared to handle contamination conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers.

This report was prepared in accordance with the generally accepted standard of practice that existed in Santa Clara County at the time the report was written. No warranty, expressed or implied, is made.

It is the CLIENT'S responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety.

This report may be used only by the client and only for the purposes stated within a reasonable time from its issuance, but in no event later than two years from the date of the report. Land use, site conditions (both on- and off-site), or other factors may change over time, and additional work may be required. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else, unless specifically agreed to in advance by Kleinfelder in writing, will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

8.0 REFERENCES

American Concrete Institute, 2008, Building Code Requirements for Structural Concrete and Commentary, ACI Standard 318-08.

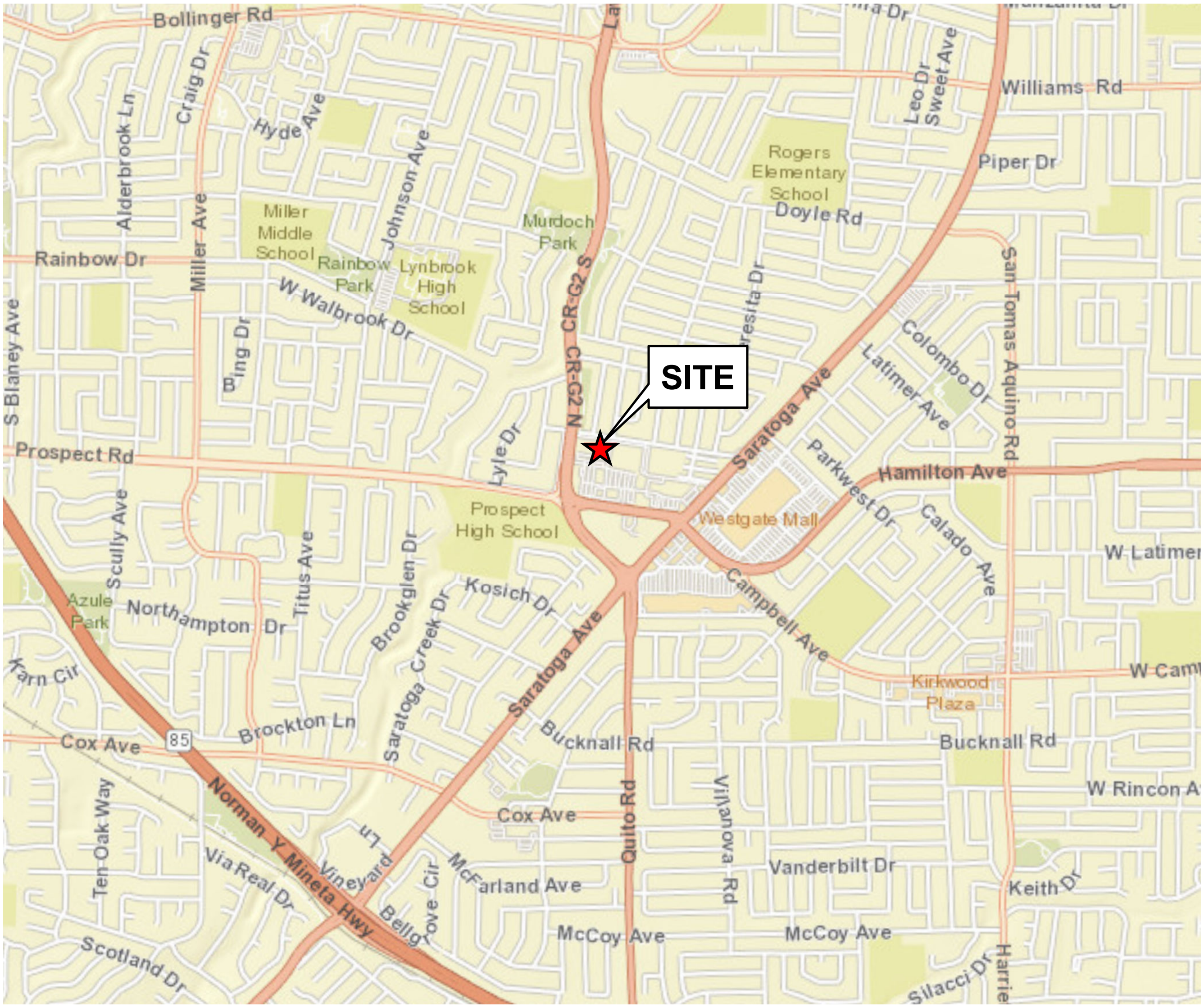
American Society for Testing and Materials, various dates, Testing Standards.

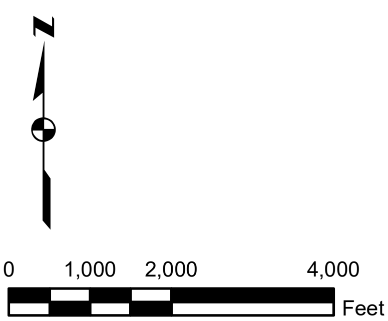
AWWA C105/A21.5 “Polyethylene Encasement for Ductile-Iron Pipe Systems.”

California Building Code, 2013, California Building Standards Commission.

California Geological Survey, CGS (2002), Seismic Hazard Zone Report for the San Jose West 7.5-Minute Quadrangle, Santa Clara County California, Seismic Hazard Zone Report 058.

FIGURES





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DRAWN:	7/19/2017
DRAWN BY:	JP
CHECKED BY:	KG
FILE NAME:	20180325_vic_II.mxd

SITE VICINITY MAP

WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

FIGURE

1

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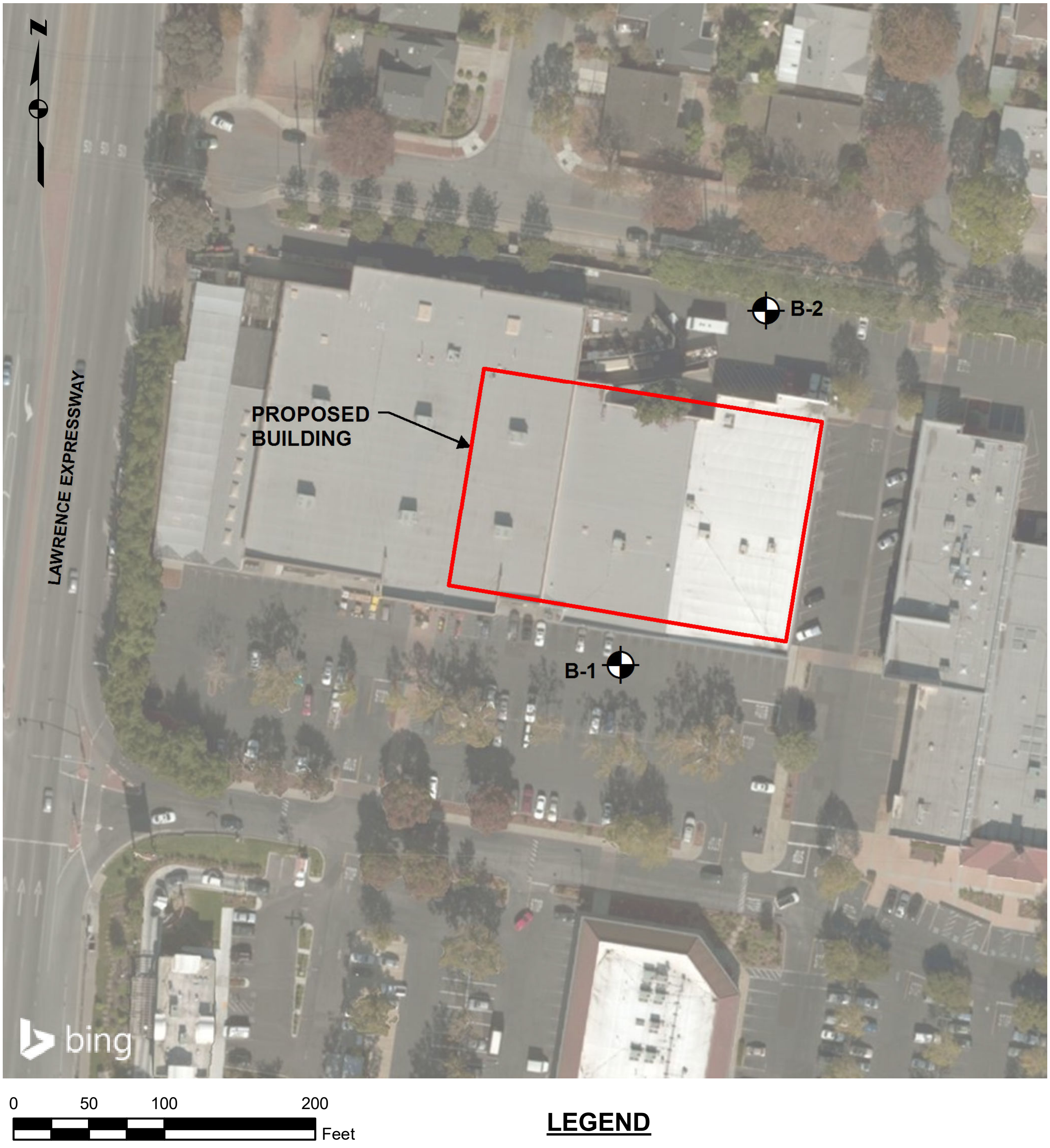

LEGEND

B-2 APPROXIMATE LOCATION OF BORING

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EXPLORATION LOCATION MAP

WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE
EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

FIGURE

2

APPENDIX A

LOGS OF EXPLORATIONS

SAMPLER AND DRILLING METHOD GRAPHICS

- BULK / GRAB / BAG SAMPLE
- MODIFIED CALIFORNIA SAMPLER (2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)
- CALIFORNIA SAMPLER (3 in. (76.2 mm.) outer diameter)
- STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
- SHELBY TUBE SAMPLER
- HOLLOW STEM AUGER
- SOLID STEM AUGER
- WASH BORING

GROUND WATER GRAPHICS

- WATER LEVEL (level where first observed)
- WATER LEVEL (level after exploration completion)
- WATER LEVEL (additional levels after exploration)
- OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

Major division	Subdivision	Fines	Criteria	Symbol	Description
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	**GRAVELS** (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu≥4 and 1≤Cc≤3	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			Cu<4 and/ or 1>Cc>3	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH 5% TO 12% FINES	Cu≥4 and 1≤Cc≤3	GW-GM	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
			Cu<4 and/ or 1>Cc>3	GP-GM	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH > 12% FINES		GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu≥6 and 1≤Cc≤3	SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			Cu<6 and/ or 1>Cc>3	SP	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH 5% TO 12% FINES	Cu≥6 and 1≤Cc≤3	SW-SM	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
			Cu<6 and/ or 1>Cc>3	SP-SM	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		SANDS WITH > 12% FINES		SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES

Major division	Subdivision	Symbol	Description
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)	ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid Limit greater than 50)	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

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DRAWN BY:	JDS
CHECKED BY:	DA
DATE:	7/19/2017
REVISED:	-

GRAPHICS KEY

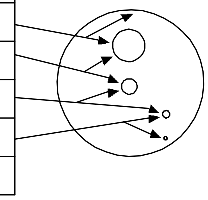
WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

FIGURE

A-1

GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles		3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse	3/4 -3 in. (19 - 76.2 mm.)	3/4 -3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine	#4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines		Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller



SECONDARY CONSTITUENT

Term of Use	AMOUNT: Secondary Constituent is Fine Grained	AMOUNT: Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N_{60} (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25≤ PP <0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5≤ PP <1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1≤ PP <2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2≤ PP <4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N_{60} (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

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PROJECT NO.: 20180325	SOIL DESCRIPTION KEY	FIGURE
DRAWN BY: JDS		
CHECKED BY: DA	WESTGATE WEST - PHASE II INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD SAN JOSE, CALIFORNIA	A-2
DATE: 7/19/2017		
REVISED: -		

BORING LOG B-1

Date Begin - End:	6/23/2017	**Drilling Company:**	West Coast Exploration		
Logged By:	K. Green	**Drill Crew:**	Zack		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	B24 Truck Mounted	**Hammer Type - Drop:**	140 lb. Manual - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Stem Auger		
Weather:	Clear, warm	**Exploration Diameter:**	about 4 in.		

Surface Condition: Asphalt

Depth (feet)	Lithologic Description (FIELD EXPLORATION)	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol (LABORATORY RESULTS)	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	Approximately 4.5 inches of Asphalt										
	Aggregate baserock										
	Sandy Lean CLAY with Gravel (CL): fine-grained sand, low plasticity, very dark brown, moist, fine to coarse grained gravel, up to 1-inch diameter, some organics present (FILL)								26	10	
		BC=8 10 9 PP=2.5	12"		17.7	110.8					TXUU: c = 2.59 ksf
5	**Lean CLAY (CL)**: trace fine-grained sand, medium plasticity, olive brown, moist, very stiff, trace fine grained gravel	BC=7 10 13 PP=3.7	14"		18.0	109.7					
		BC=12 12 14 PP=4.5	15"		9.0	112.5					
10	**Gravelly Lean CLAY with Sand (CL)**: fine-grained sand, low plasticity, olive brown, moist, very stiff, fine grained gravel, mottled yellow	BC=18 12 15 PP=>4.5	14"								
	Poorly graded SAND with Gravel (SP): non-plastic, olive brown, moist, medium dense, trace fines	BC=14 12 12	17"								cobble at about 14'
15				SP			65	4.4			
	Lean CLAY (CL): low plasticity, olive brown, moist, very stiff	BC=6 8 10									
20	**Gravelly Lean CLAY (CL)**: low plasticity, olive brown, moist, hard, fine grained gravel, yellow mottling, trace sand	BC=15 15 22 PP=>4.5	10"								hit cobbles at about 22', recovered cobble 3-inch diameter subrounded, auger refusal at about 22.5'
		BC=55/5"	NR								
25											

The boring was terminated at approximately 22.5 ft. below ground surface. The boring was backfilled with grout and cold patch at surface on June 23, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
NR=No Recovery

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PROJECT NO.: 20180325		BORING LOG B-1	FIGURE
DRAWN BY:	JDS		
CHECKED BY:	DA	WESTGATE WEST - PHASE II INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD SAN JOSE, CALIFORNIA	A-3
DATE:	7/19/2017		
REVISED:	-		PAGE: 1 of 1

BORING LOG B-2

Date Begin - End:	6/23/2017	**Drilling Company:**	West Coast Exploration		
Logged By:	K. Green	**Drill Crew:**	Zack		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	B24 Truck Mounted	**Hammer Type:**	Manual
Plunge:	-90 degrees	**Drilling Method:**	Solid Stem Auger		
Weather:	Clear, warm	**Exploration Diameter:**	about 4 in.		

FIELD EXPLORATION / LABORATORY RESULTS

Surface Condition: Asphalt

Depth (feet)	Lithologic Description	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	Approximately 5 inches of Asphalt										
	Aggregate baserock										
	Sandy Lean CLAY with Gravel (CL): fine-grained sand, low plasticity, very dark brown, moist, fine to coarse gravel (FILL)								28	11	
		BC=10 10 12 PP=>4.5	14"								
	Lean CLAY (CL): trace fine-grained sand, medium plasticity, olive brown, moist, very stiff, trace fine grained gravel				13.4	106.4					TXUU: c = 1.98 ksf
5	with sand and gravel	BC=20 18 16 PP=>4.5	14"		5.1	118.7					
	Gravelly Lean CLAY with Sand (CL): fine-grained sand, low plasticity, moist, very stiff, fine to coarse grained gravel up to 3-inch diameter	BC=12 12 11 PP=>4.5	15"		8.1	114.3					
10	hard	BC=13 18 18 PP=>4.5	14"								
	Lean CLAY (CL): trace fine-grained sand, medium plasticity, olive brown, moist, very stiff, trace fine grained gravel										
15		BC=12 12 14 PP=>4.5	10"								
	Lean CLAY with Gravel (CL): trace fine-grained sand, low plasticity, olive brown, moist, hard, fine to coarse gravel up to 1-inch diameter, yellow mottling										
20		BC=15 17 25 PP=>4.5	14"								
25		BC=50/5"	NR								Auger refusal at about 25'

The boring was terminated at approximately 25 ft. below ground surface. The boring was backfilled with grout and cold patch at surface on June 23, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
NR=No Recovery

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BORING LOG B-2

WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

FIGURE A-4

APPENDIX B

LABORATORY TESTING RESULTS

Exploration ID	Depth (ft.)	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
					Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-1	1.0 - 2.5	VERY DARK BROWN SANDY LEAN CLAY WITH GRAVEL (CL)						26	16	10	
B-1	3.0		17.7	110.8							TXUU: c = 2.59 ksf
B-1	5.5		18.0	109.7							
B-1	8.5		9.0	112.5							
B-1	15.0	OLIVE BROWN POORLY GRADED SAND WITH GRAVEL (SP)			87	65	4.4				
B-2	1.0 - 2.5	VERY DARK BROWN SANDY LEAN CLAY WITH GRAVEL (CL)						28	17	11	
B-2	3.5		13.4	106.4							TXUU: c = 1.98 ksf
B-2	6.0		5.1	118.7							
B-2	8.0		8.1	114.3							

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic

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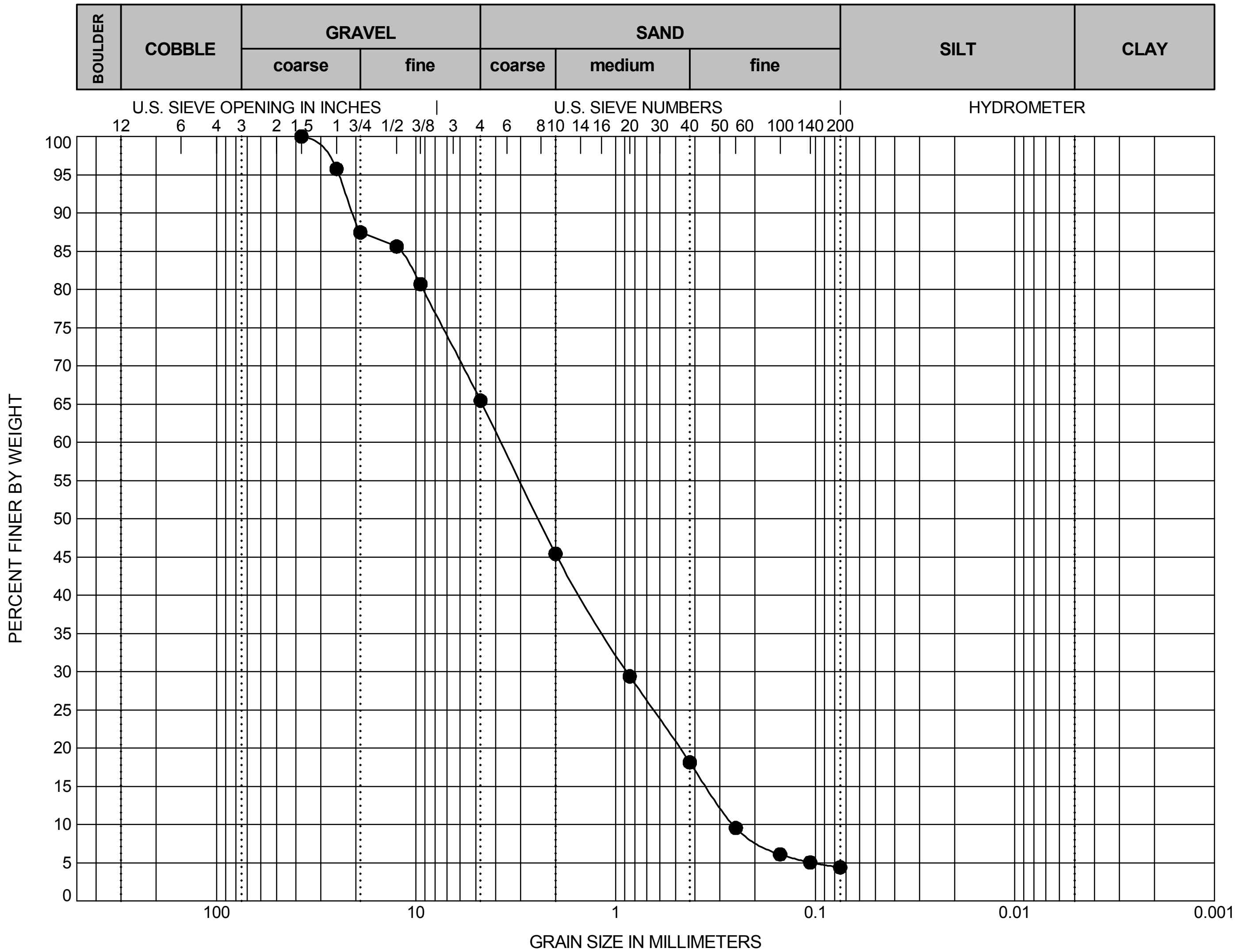
LABORATORY TEST RESULT SUMMARY

WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

FIGURE

B-1



	Exploration ID	Depth (ft.)	Sample Description	LL	PL	PI
●	B-1	15	OLIVE BROWN POORLY GRADED SAND WITH GRAVEL (SP)	NM	NM	NM

	Exploration ID	Depth (ft.)	D_{100}	D_{60}	D_{30}	D_{10}	Cc	Cu	Passing 3/4"	Passing #4	Passing #200	%Silt	%Clay
●	B-1	15	37.5	3.755	0.879	0.257	0.80	14.60	87	65	4.4	NM	NM

Sieve Analysis and Hydrometer Analysis testing performed in general accordance with ASTM D422.
NP = Nonplastic
NM = Not Measured

Coefficients of Uniformity - $C_u = D_{60} / D_{10}$
Coefficients of Curvature - $C_C = (D_{30})^2 / D_{60} D_{10}$
D_{60} = Grain diameter at 60% passing
D_{30} = Grain diameter at 30% passing
D_{10} = Grain diameter at 10% passing

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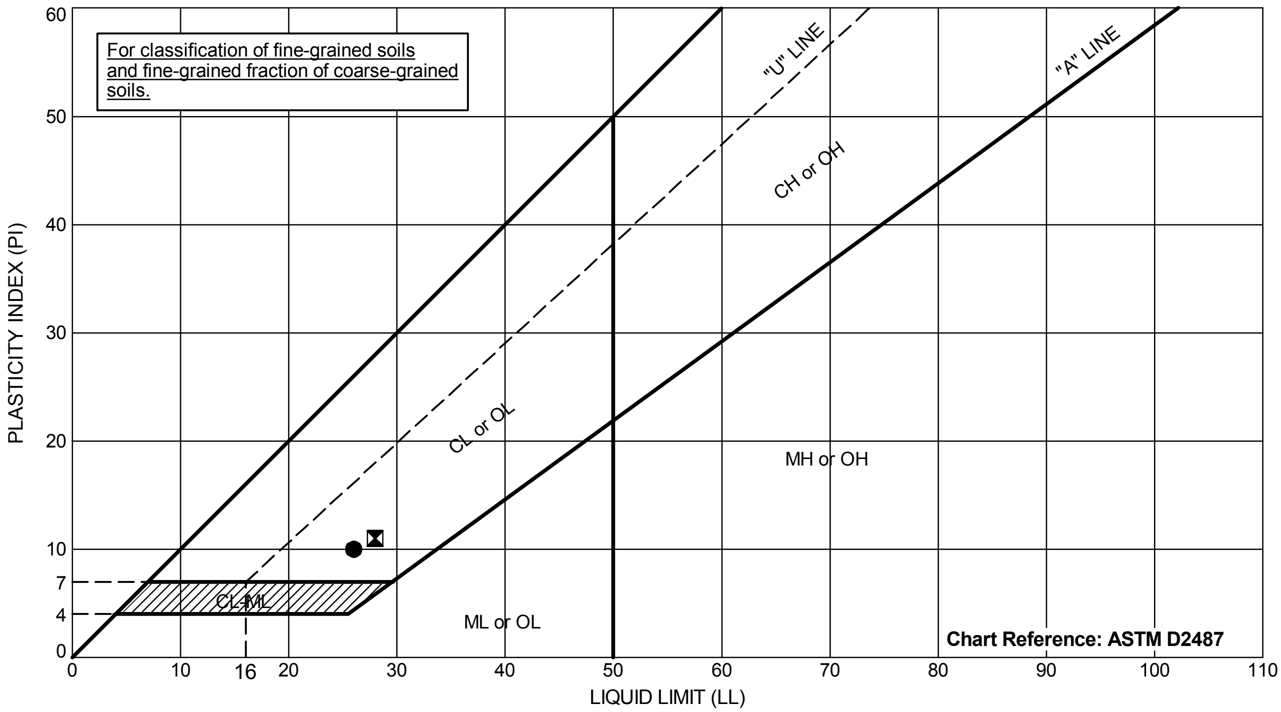
PROJECT NO.: 20180325	SIEVE ANALYSIS		FIGURE
DRAWN BY: JDS			
CHECKED BY: DA	WESTGATE WEST - PHASE II INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD SAN JOSE, CALIFORNIA		B-2
DATE: 7/19/2017			
REVISED: -			



Exploration ID	Depth (ft.)	Sample Description	Passing #200	LL	PL	PI
● B-1	0 - 2.5	VERY DARK BROWN SANDY LEAN CLAY WITH GRAVEL (CL)	NM	26	16	10
⊠ B-2	1 - 2.5	VERY DARK BROWN SANDY LEAN CLAY WITH GRAVEL (CL)	NM	28	17	11

Testing perfomed in general accordance with ASTM D4318.
NP = Nonplastic
NM = Not Measured

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PROJECT NO.: 20180325
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CHECKED BY: DA
DATE: 7/19/2017
REVISED: -

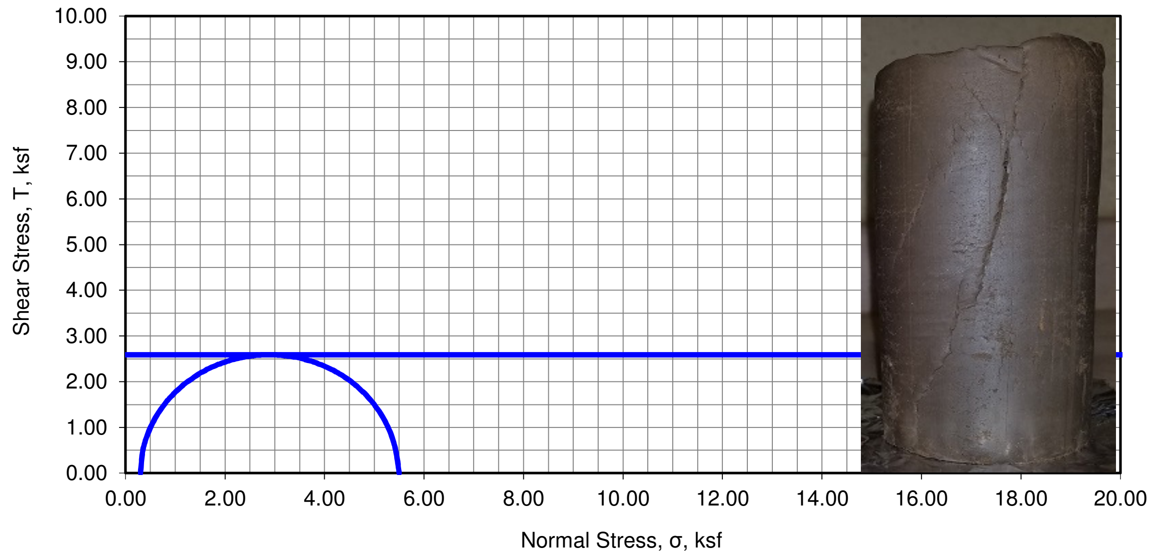
ATTERBERG LIMITS

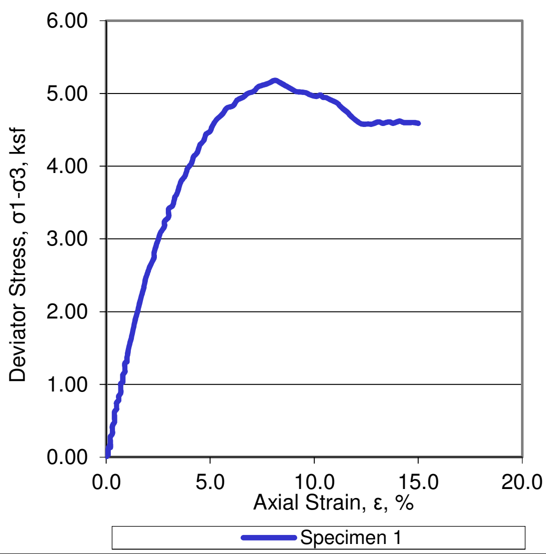
WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE
EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

FIGURE
B-3

Total	
c = 2.59	ksf

Specimen Shear Picture





Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.53
	Water Content, %	ω_O	17.7
	Dry Density, lbs/ft^3	γd_o	110.8
	Saturation, %	S_O	95
	Void Ratio	e_O	0.493
Minor Principal Stress, ksf		σ_3	0.30
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	5.18
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	8.08
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	4.59
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		$'\varepsilon$	1.00
Axial Strain at Failure, %		ε_f	8.08

Description of Specimen: Dark Olive Brown Sandy Lean Clay (CL)

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.65 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850

Membrane correction applied

Boring:	B-1
Sample:	1C
Depth, ft:	3.0
Test Date:	6/30/17

Remarks: nm= not measured, na = not applicable

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2601 Barrington Ct, Hayward, CA 94545

Project No.:	20180325.002A
Date:	7/6/17
Entry By:	CP
Checked By:	CP
File Name:	HL10294

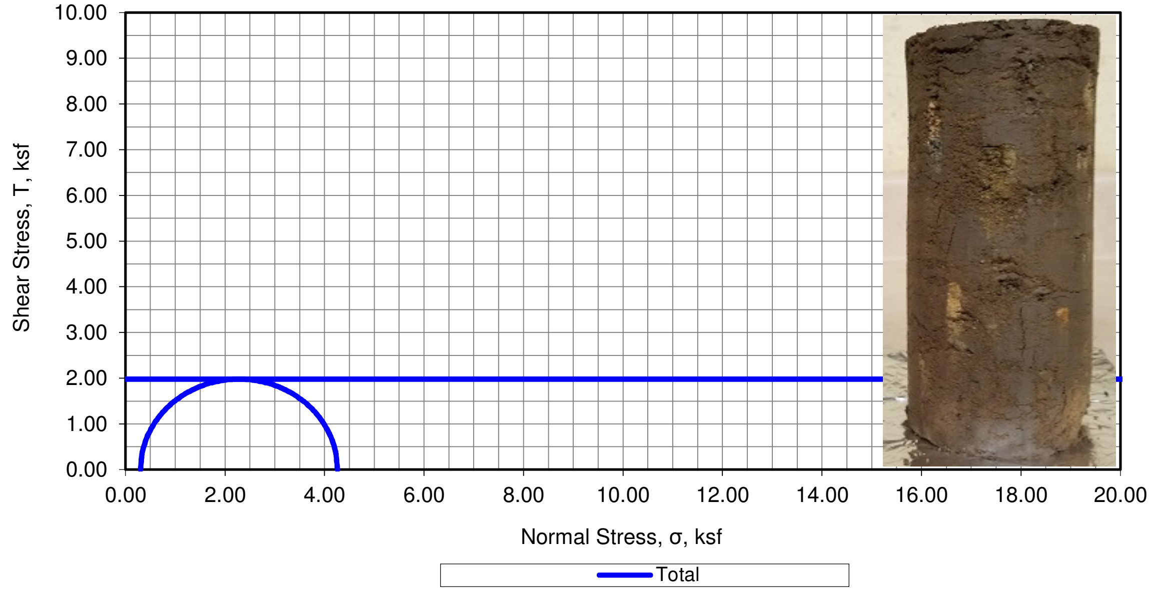
TRIAXIAL COMPRESSION TEST (UU)

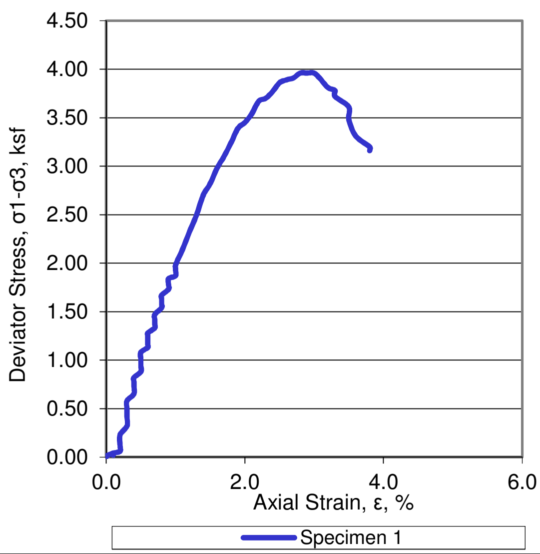
**WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE
EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA**

Figure
1 of 1
B-4

Total	
c = 1.98	ksf

Specimen Shear Picture





Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.80
	Water Content, %	ω_O	13.4
	Dry Density, lbs/ft^3	γd_o	106.4
	Saturation, %	S_O	64
	Void Ratio	e_O	0.554
Minor Principal Stress, ksf		σ_3	0.30
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	3.96
Time to $(\sigma_1\text{-}\sigma_3)_{max}$, min		t_f	2.85
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	3.20
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		'ε	1.00
Axial Strain at Failure, %		ε_f	2.85

Description of Specimen: Dark Olive Brown Sandy Lean Clay (CL)

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.65 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850

Membrane correction applied

Boring:	B-2
Sample:	1C
Depth, ft:	3.5
Test Date:	6/30/17

Remarks: nm= not measured, na = not applicable

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Project No.:	20180325.002A
Date:	7/6/17
Entry By:	CP
Checked By:	CP
File Name:	HL10294

TRIAXIAL COMPRESSION TEST (UU)

WESTGATE WEST - PHASE II
INTERSECTION OF LAWRENCE EXPRESSWAY AND PROSPECT ROAD
SAN JOSE, CALIFORNIA

Figure
1 of 1
B-5

APPENDIX C

ANALYTICAL TEST RESULTS BY OTHERS

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: Kleinfelder
Client's Project No.: 20180325.002A
Client's Project Name: Westgate West Shopping Center Phase II
Date Sampled: 23-Jun-2017
Date Received: 6-Jul-2017
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 19-Jul-2017

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Resistivity (As Received) (ohms-cm)	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
1707033-001	B-1, A @ 1'	+470	8.00	7,500	1,700	N.D.	N.D.	55

Method:	ASTM D1498	ASTM D4972	ASTM G57	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	-	-	50	15	15
Date Analyzed:	18-Jul-2017	17-Jul-2017	17-Jul-2017	17-Jul-2017	10-Jul-2017	18-Jul-2017	18-Jul-2017

Cheryl McMillen
Laboratory Director

* Results Reported on "As Received" Basis
N.D. - None Detected

Quality Control Summary - All laboratory quality control parameters were found to be within established limits

APPENDIX D

GBA INFORMATION SHEET

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GBA GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org